



Enterprise Data Management Data Governance Plan

Version 1.0

June 29, 2007



START HERE
GO FURTHER
FEDERAL STUDENT AID™

Table of Contents

Executive Summary	1
1. Understanding Data Governance	2
1.1 What Data Governance Is	2
1.1.1 What Data Governance Isn't.....	2
1.2 Why Data Governance Is Needed.....	2
1.2.1 Management as a program, not as a project.....	4
1.2.2 Measurable goals	7
1.2.3 Planning	8
1.2.4 Personnel.....	8
1.2.5 Expertise	10
1.2.6 Integration Tool	10
1.2.7 Willingness to change	10
1.3 Implementation of Data Governance.....	11
1.3.1 Functional and Organizational Infrastructure	11
1.3.2 Technical Infrastructure	11
1.3.3 Policies and Procedures	11
1.3.4 The EDM Data Governance and Metadata Manager.....	12
1.3.5 The Metadata Repository.....	12
1.3.6 The Data Quality Aspect of Data Governance	12
1.3.7 The Data Governance Activity Matrix	13
2.0 The Management of Data Governance	14
2.1 Overview.....	14
2.1.1 Business and Stakeholder Involvement	15
2.1.2 Executive Data Governance Council	15
2.1.3 Strategic Data Governance Steering Committee	15
2.1.4 Tactical Data Governance Work Group	15
2.1.5 Enterprise Change Control Board	16
2.1.6 Specific Roles – Data Stewards	16
3.0 The Process of Data Governance.....	19
3.1 High Level Plan and Milestones.....	20
3.2 On-Going Data Governance	20
Appendix A. Glossary	21
Appendix B. Abbreviations / Acronyms	23
Appendix C. References	24
Appendix D. EDM support as part of OneEd Lifecycle.....	25
Appendix E. Data Governance Charter.....	27

Purpose/Approach.....	27
Scope27	
Objectives	27
Deliverables	28
Quality Objectives	28
Organization and Responsibilities	28
Plans for Support Activities	29
Risk Management	30
Schedule.....	30
Governance Effort Estimate.....	30

List of Tables

Table 1: Data governance and metadata management sub-functions.	9
Table 2: EDM support of OneEd Life cycles.	26

List of Figures

Figure 1: Data governance program structure.	3
Figure 2: Target State Enterprise Data Management.....	5
Figure 3: Defining data governance goals and measuring their achievement.	7
Figure 4: A framework for a sample data governance activity matrix.	13
Figure 5: Data governance management structure and information flow.....	14
Figure 6: Standard Approval Process	19

Document History

Change Number	Date (m-d-y)	Paragraph, Number of Table or Figure	A* M D	Brief Description	Author	Change Request Number
1.0	06/29/2007		M	Final Draft		

Executive Summary

Data management is the exercise of guidance over the management of data assets and the performance of data functions. Data governance¹ refers to the overall management of the availability, usability, integrity, and security of the data employed in an enterprise. A sound data governance program includes a governing body or council, a defined set of procedures, and a plan to execute those procedures. In practical terms, that means putting personnel, policies, procedures, and organizational structures in place to make data accurate, consistent, secure, and *available* to accomplish Federal Student Aid's mission. It takes on special importance because of Federal Student Aid's responsibilities and the legal requirements it must fulfill.

Effective data governance makes Federal Student Aid more efficient by saving money, allowing re-use of data, and supporting enterprise analytics. However, data governance requires more than just a few members of the IT staff with a project plan. It requires participation and commitment of both IT and business management, as well as senior-level executive sponsorship and active consultation with education communities of interest. The data governance program enables Federal Student Aid to effectively manage data assets due to assigned responsibilities and rules of the engagement.

At Federal Student Aid, data governance is planned, managed, and implemented through a three-level structure:

- The Executive Data Governance Council (Executive Council) provides strategic direction, ensuring that data governance efforts address all relevant and mission-critical needs of the enterprise. It manages data governance as an integrated program rather than as a set of unconnected projects.
- The Strategic Data Governance Steering Committee (Strategic Committee) carries out plans and policies to implement guidance from the Executive Data Governance Council. It prioritizes data governance efforts and communicates with stakeholders, users, and other communities of interest. It identifies staff (data stewards) to oversee areas of data (data domains).
- The Tactical Data Governance Working Group (Tactical Group) implements plans and policies developed by the EDM Governance team, and analyzes and resolves any tactical problems that arise.

Communication is very important for successful data governance. To succeed in a data governance program, management bodies and implementation team(s) must tell stakeholders (i.e., you, the readers of this document) what steps are being taken and why, must inform all relevant communities of interest about how data governance will benefit them, and must *listen* to stakeholders and communities of interest to incorporate their ideas and feedback into the data governance program. Input and feedback makes governance efforts more effective in achieving mission-critical goals and is vital for successful data governance.

¹ http://searchdatamanagement.techtarget.com/sDefinition/0,290660,sid91_gci1151688,00.html

1. Understanding Data Governance

1.1 What Data Governance Is

Data governance is a component of data management that can be defined in several ways. The CIO Magazine says "Management is the decisions you make, governance is the structure for making them." One source² defines it as "Data governance refers to the organizational bodies, rules, decision rights, and accountabilities of people and information systems as they perform [data] information-related processes."

Depending on their specific needs, different organizations will choose different management structures to implement data governance. It is less important to follow a particular organization chart than it is to ensure that data governance management makes data:

- Reliable
- Consistent
- Complete
- Easily available to those with a legitimate need for it
- Unavailable to those without a legitimate need or authorization for it

These goals should guide Federal Student Aid in planning and managing its data governance program.

1.1.1 What Data Governance Isn't

Understanding what data governance *is not* can help focus on what it *is*. In particular, data governance is not:

- Change management
- Data cleansing or extract, transform and load data (ETL)
- Data warehousing
- Database design

Data governance applies to each of these disciplines but is not included in any of them.

1.2 Why Data Governance Is Needed

Historically, data has been collected and managed at the level of individual departments for their own needs. Each department has developed procedures, data formats, and terminology that fit its unique situation and preferences. As long as there was no need to integrate or exchange the data, such inconsistencies were harmless.

² Data Governance Institute, June 2007

Today, however, both mission goals and legal mandates require large organizations such as Federal Student Aid to report on their activities at the enterprise level. This means that such organizations need to:

- Migrate data from legacy systems into new systems and formats.
- Integrate and synchronize data from different systems that use different formats, field names, and data characteristics.
- Reconcile inconsistent or redundant terminology into a single data dictionary providing agreed upon definitions and properties for each data element.
- Report data in standard formats and with standard interpretations.

Data governance makes it possible to fulfill those needs. As a component of data management, data governance provides and enforces enterprise-wide data standards, common vocabulary, reports, and the development and use of standardized data. It enables Federal Student Aid to more easily integrate, synchronize and consolidate data from different departments, exchange data with other organizations in a common format, and communicate effectively through shared terms and report formats.

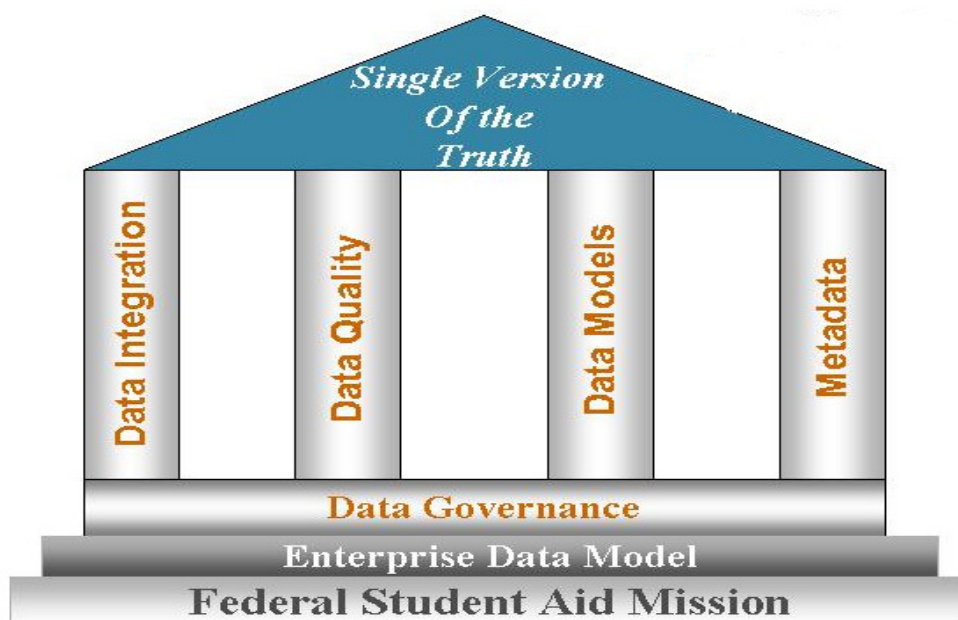


Figure 1: Data governance program structure.

Federal Student Aid faces the classic challenges of enterprise-level data integration. Figure 1 shows the importance of the data governance program structure to meet these challenges. The benefits of data governance include enterprise standardization for data and systems, the ability to make use of merged data for additional knowledge discovery, and increased leverage when dealing with external data suppliers.

1.2.1 Management as a program, not as a project

The management of data across the enterprise relies on commonly agreed-upon data definitions. Data governance defines processes and procedures for reaching this goal. Federal Student Aid will manage data governance as a program rather than as a series of disconnected, one-off projects. Program management is a “best practice” for data governance.

Program management differs fundamentally from project management. Project management focuses on the achievement of immediate tasks with specifically allocated resources and time. Program management, on the other hand, manages multiple related tasks, each of which makes its own contribution to overall strategic goals. Program management allows the data governance team to use work from earlier projects in later projects, avoid duplicated effort, and ensure that all the program’s projects work smoothly together in support of desired strategic goals.

In addition, data governance depends on management support. It demands the vision, leadership and cooperation at the top enterprise as well as the community level. The commitment of the leadership team is essential for the success of a data governance program.

Federal Student Aid Target State Enterprise Data Management Deliverables Listed by Functional Area					
Strategic Planning	Data Governance & Metadata Mgt.	Data Architecture	Data Warehousing	Data Quality	Data Security
Perform EDM Strategic Planning.	Define Data Governance Process.	Develop and Maintain The Enterprise Data Models.	Develop and Maintain Enterprise Dimensional Data Models.	Develop and Promote Data Quality Best Practices.	Develop and Implement Data Security and Privacy Standards.
Define Data Policies.	Implement Data Governance Process.	Develop and Maintain Modeling And Design Standards.	Develop DW and BI Architecture.	Define Data Profiling Process.	Develop and Promote Data Security and Privacy Best Practices.
Promote Compliance with Data Policies, Procedures and Standards.	Create, Capture and Maintain Enterprise Metadata (Data Standardization).	Establish and Maintain Enterprise Data Architecture.	Develop DW and BI Technical Standards.	Manage Data Quality.	Perform Data Security Auditing.
Publicize and Promote Data Management.	Develop and Implement Enterprise Metadata Architecture.	Develop and Maintain Data Integration and MDM Architecture.		Measure Data Quality.	
Identify and Justify Resources and Budget Needs.	Create and Maintain Master Data Management (MDM) Standards.	Provide Database Administration (DBA) Support.			
Monitor EDM Program Performance.		Assess Application Integration Interface.			
Coordinate with External Standards Organizations.		Evaluate Tools.			

Figure 2: Target State Enterprise Data Management

1.2.2 Measurable goals

Measurable goals are essential to monitor the effectiveness of the data governance program, just as they are essential in other areas of management. Some authorities see measurable goals as part of the definition of data governance. For example, Jeanne Ross and Peter Weil of the Massachusetts Institute of Technology (MIT) say that governance should ensure “decisions match company-wide objectives by establishing mechanisms for linking objectives to measurable goals.”³

Setting measurable goals is not enough: Federal Student Aid must choose the *right* goals to measure. Anything an organization measures will tend to improve – sometimes, at the expense of other things that the organization does not measure. For example, if a manufacturing plant measures how many parts workers produce per minute but pays no attention to defects or worker attrition, it will get an increase in all three factors – one of them desirable and two undesirable.

Defining and using measurable goals requires applying the more general discipline of business performance management (BPM) to data governance. Figure 3 shows an outline of the process.

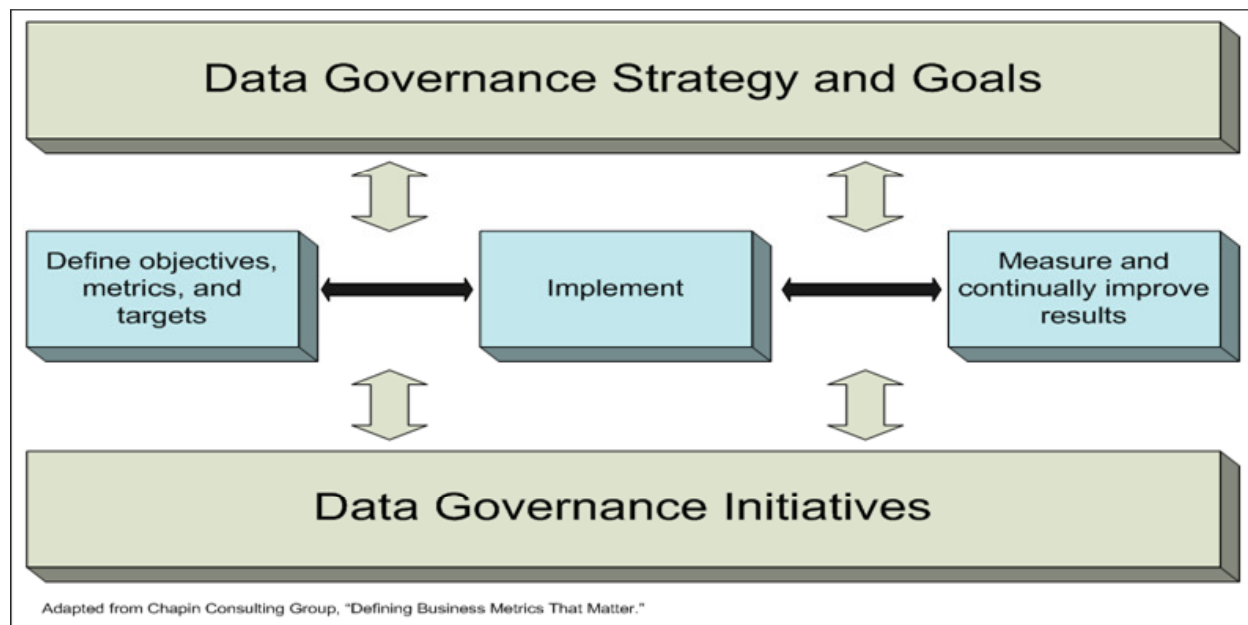


Figure 3: Defining data governance goals and measuring their achievement.

Two key steps can help identify the right goals to measure:⁴

1. Identify and define “value metrics” linked to the goals of data governance, such as increased data reliability and consistency such as the number of approved standardized data elements in the XML Registry & Repository.

³ Quoted in Daniel Linstedt, “Governing Governance,” *Teradata Magazine Online*, <http://www.teradata.com/t/page/150213/index.html>.

⁴ “Defining Business Metrics That Matter: Improving Business Results.” Chapin Consulting Group (www.chapinconsulting.com), 2006. Available from The Data Warehousing Institute (www.tdwi.org).

2. Identify and define additional “analysis metrics” linked to the processes of data governance and to possible negative side-effects of monitoring the value metrics. For instance, how many projects that create XML Schemas conform to standards.

The EDM Team will develop scorecards and other tools to monitor performance in collaboration with the business owners and other stakeholders. Balanced scorecards, in particular, are useful to monitor the achievement of non-metric goals.⁵

1.2.3 Planning

Federal Student Aid will do data governance planning at three levels, with two additional levels providing input and support:

- The Executive Data Governance Council (Executive Council) sets the overall mission and strategic goals of data governance. It also obtains needed funding and resources.
- The Strategic Data Governance Steering Committee (Strategic Committee) develops the high-level task plan to achieve the strategic goals mandated by the Executive Council. The EDM Program Manager chairs the Strategic Committee.
- The Tactical Data Governance Working Group (Tactical Group) develops short-term goals and tasks to implement the high-level plan mandated by the Strategic Committee. To do so, it includes data stewards and subject matter experts as members.
- Business owners, users, project managers, and other stakeholders in Federal Student Aid and its affiliates provide ideas and feedback to the formal management organization for data governance.

Section 2 of this document (“The Management of Data Governance”) provides more detail about these management groups.

1.2.4 Personnel

EDM has functions dedicated to Data Governance, as well as the different management bodies described above. In accordance with Federal Student Aid’s Concept of Operations (CONOPS) document⁶, data standardization policies are approved and implemented by the CIO and must be followed. Table 1 summarizes the areas of responsibility.

Sub-function	Description
Define Data Governance Process	<p>Design and implement a governance framework for defining a consistent view of all business-driven data elements. The governance framework should:</p> <ul style="list-style-type: none">• Designate data stewardship responsibilities among both business and IT organizations.• Define a virtual governance hierarchy with participation

⁵ See Williams and Williams, *The Profit Impact of Business Intelligence*, pp.152-154 and “Balanced Scorecard” in Wikipedia, http://en.wikipedia.org/wiki/Balanced_scorecard.

⁶ “Enterprise Data Management Concept of Operations – Final,” Federal Student Aid, January 25, 2007.

Sub-function	Description
	<p>from business, IT operations and management.</p> <ul style="list-style-type: none">• Define the roles and responsibilities of data stewards• Establish a set of procedures used to define, review and approve data standards.
Implement Data Governance Process	<ul style="list-style-type: none">• Identify and coordinate data stewards.• Establish and coordinate the Data Stewardship Council.• Follow procedures to define, review and approve data standards.
Create, Capture and Maintain Enterprise Metadata (Data Standardization)	<ul style="list-style-type: none">• Create standardized definitions for data elements, attributes and schemas in an online registry.• Capture and maintain enterprise shared metadata, including, but not limited to, naming standards, data classification, business rules, data models, data dictionary, data format standards, and descriptions of shared services.
Develop and Implement Enterprise Metadata Architecture	<p>Enable the creation, storage, manipulation, control, integration, distribution, use and change management of enterprise-level shared metadata. Enterprise Metadata Architecture consists of:</p> <ul style="list-style-type: none">• Create and maintain a metadata strategy.• Inventory and integrate decentralized metadata tools.• Define and execute change management procedures for enterprise metadata repositories and the XML registry.
Create And Maintain Master Data Management (MDM) Standards	<p>Serve as the liaison among business owners to:</p> <ul style="list-style-type: none">• Define authoritative sources of shared data entities.• Build organization consensus for the logical data structures of shared data elements.• Define and capture, as part of the enterprise metadata, the business rules that govern the creation and updates of shared data elements.

Table 1: Data governance and metadata management sub-functions.

The EDM Team will support the business units and participate in the Tactical Group and the Data Stewards will implement their directives in the data domains for which they are responsible.

1.2.5 Expertise

At the top level, members of the Executive Council (including the CIO) will provide global understanding of the needs and issues faced by Federal Student Aid. Members of the Strategic Committee will incorporate that global understanding into a slightly lower-level strategic plan for data governance in specific operational areas and departments.

The EDM Data Governance and Metadata Manager, who chairs the Tactical Data Governance Working Group, will provide expertise to identify general issues of data governance that the effort needs to address, such as data standardization. This individual will also help identify the metadata that needs to be collected for data governance.

Staff members who are experts in specific data domains in Federal Student Aid participate in the Tactical Group. These individuals know their data domains and the business processes that use their data. As such, they will identify how prospective changes in their data will affect business processes at Federal Student Aid. They will also assess and help to improve data quality in their areas, and will present recommendations for identified data quality issues.

1.2.6 Integration Tool

Federal Student Aid is in the process of research and tool evaluation to acquire a tool suite supporting the overall data management effort. The tool set will cover data quality, data profiling, management of data assets such as data dictionary and data model inventory, as well as reporting on data.

1.2.6.1 Intranet Data Governance Site

The EDM Team is in the process of updating the data portion of the EA intranet site to communicate data-related matters. The site will provide guidance, best practices, policies, and procedures related to data management for the communities of practice and communities of interest.

1.2.7 Willingness to change

As with all new standards, senior management expects that all development efforts will support and comply with data governance efforts. Data governance is a service to the organization that will deliver higher data quality, as well as consistent data use across the organization and with business partners. It will enable Federal Student Aid to improve business analytics and thereby empower senior management in making educated business decisions.

That being said, change – even beneficial change – is always uncomfortable. We all know how to do things the way we’ve been doing them: for a long time, those old ways have seemed to be “good enough.” However, changes are required to make the Enterprise better. A slow, stepwise approach to change will help. Most important is the willingness of those involved – both in data governance management and in its communities of interest – to listen to each other and work collaboratively to achieve the best result for everyone.

1.3 Implementation of Data Governance⁷

Data governance is a vital keystone in the process of building enterprise-wide data management. As such, it's one of the essential foundation pillars of the EDM.

The EDM Team will work with business owners and senior management to introduce data governance to Federal Student Aid. The Team will work closely with stakeholders, whose feedback and comments (both positive and negative) will help improve policies and procedures to better serve the needs of Federal Student Aid.

Data governance implementation includes various tasks, such as Master Data Management (MDM) and Data Stewardship. MDM supports the integration of Data Governance and Data Quality Control. Data governance management bodies will share responsibility for such tasks with EDM and the business owners.

1.3.1 Functional and Organizational Infrastructure

Functional and organizational infrastructure will be created by establishing EDM as a function within Federal Student Aid. EDM is empowered to execute data management tasks and establish different support functions that they require. Data governance management will be structured as described in Section 2.1 of this document.

1.3.2 Technical Infrastructure

Data Governance will support Federal Student Aid as it successfully and effectively deploys new technology and architectural principles such as Service-Oriented Architecture (SOA), Data Integration Services (DIS) and Enterprise Information Integration (EII). All of these principles (SOA, DIS, and EII) depend on high data quality and consistent use of information across the organization.

1.3.3 Policies and Procedures

As data governance encompasses the people, processes and procedures to create a consistent, enterprise view of a Federal Student Aid's data in order to increase consistency and confidence in decision-making, decrease the risk of regulatory fines and improve data security, the data governance policy serves as the backbone of the data governance program. It supports any actions and insures that the governing of data is *not optional*. The Executive Council will communicate and approve the data governance policy.

1.3.3.1 Data Governance Policy

Currently, the EDM Team is defining an enterprise data governance plan based on industry best practices. The policies are⁸:

- **Participate in the enterprise data governance program:** Business owners will participate in the enterprise data governance program and will represent relevant Business Capability Areas (BCAs) in the decision making process.

⁷This section draws on Robert S. Seiner's "The Data Stewardship Approach to Data Governance Chapter Three: The Tools of Data Governance" (*The Data Administration Newsletter*, www.tdan.com).

⁸ Task 15025 Draft Enterprise Data Management Data Policies – Final; June 1, 2007

- **Assign enterprise data stewardship:** Business owners will designate data stewards from their BCAs. The data stewards will have day-to-day responsibility for coordinating data governance activities

1.3.3.2 Data Governance Procedures

Data governance procedures are developed by the EDM Team and approved by the Executive Council. They are contained in these documents:

- 1) Data Standardization Policies and Procedures
- 2) Data Model Policies and Procedures, and Registration Standards
- 3) PESC Standards, Policies and Guidelines
- 4) PESC Guidelines for XML Architecture and Data Modeling.

1.3.4 The EDM Data Governance and Metadata Manager

The EDM Metadata Manager manages a repository of information connecting each data steward with the data for which he or she is responsible. Conversely, it connects each group or category of data with the data steward(s) who oversee it. This kind of information is called “metadata” because it is data about the data.

This information repository enables management, data steward coordinators, and stakeholders to identify and communicate quickly with data stewards. In addition, data domain stewards and operational data stewards can use the repository to reach data stewards in other business units of Federal Student Aid or the Department of Education.

1.3.5 The Metadata Repository

As its name implies, the enterprise-wide Metadata Repository contains data about the organization’s data. It might contain:

- Community agreed-upon information.
- Current-state information about data formats used by various systems and departments, as well as the terminology used by each department to describe the data.
- Target-state information about desired common data formats, data definitions, and methods for reconciling incompatible data sources.

1.3.6 The Data Quality Aspect of Data Governance

Deciding and acquiring a data quality tool that can automatically check data sets to ensure that they meet the data quality standards set by the data governance team will be of great advantage to Federal Student Aid. The tool will support the EDM team in its efforts to ensure the availability, usability, integrity and security of the data employed at Federal Student Aid through a well-defined set of procedures and a means to execute those procedures.

The tool will capture the results in a consistent electronic format allowing further analysis and sharing of the outcome with business owners for review and corrective action.

The data quality tool can be an indispensable check on the validity, accuracy and compatibility of migrated data. It can catch errors that, further down the line, might be cost-prohibitive to correct.

1.3.6.1 The Data Quality Issue Log

The Data Quality Issue Log enables data governance stakeholders to record problems or other issues that they find with data.

Data stewards and data steward coordinators should review the log on a regular basis and should record the actions they take to resolve problems and issues they find in the log. They should also note whether problems or issues are *local*, affecting only one department, or *strategic*, affecting the entire Federal Student Aid data governance effort.

Data stewards also use the Data Quality Issue Log for recording information about data quality problems, solutions, and results. The EDM Team monitors the Issues Log and addresses the issues as appropriate.

1.3.7 The Data Governance Activity Matrix

The Data Governance Activity Matrix is a row-and-column table that correlates the organization's data with the roles and responsibilities of each member and group in the data governance management structure. It helps data governance management allocate tasks among different team members and working groups. Figure 4 shows a framework for such a matrix.

	IPM	CPS	COD	CSB	NSLDS	FMS	CIO
Master Data - Organization	X	X	X	X	X	X	X
Master Data - Person	X	X	X	X	X	X	X
Master Data - Aid	X	X	X	X	X	X	X
ECDM - Business Owners sign off	X	X	X	X	X	X	X
Data Migration - IPM	X						

Figure 4: A framework for a sample data governance activity matrix.

2.0 The Management of Data Governance

2.1 Overview

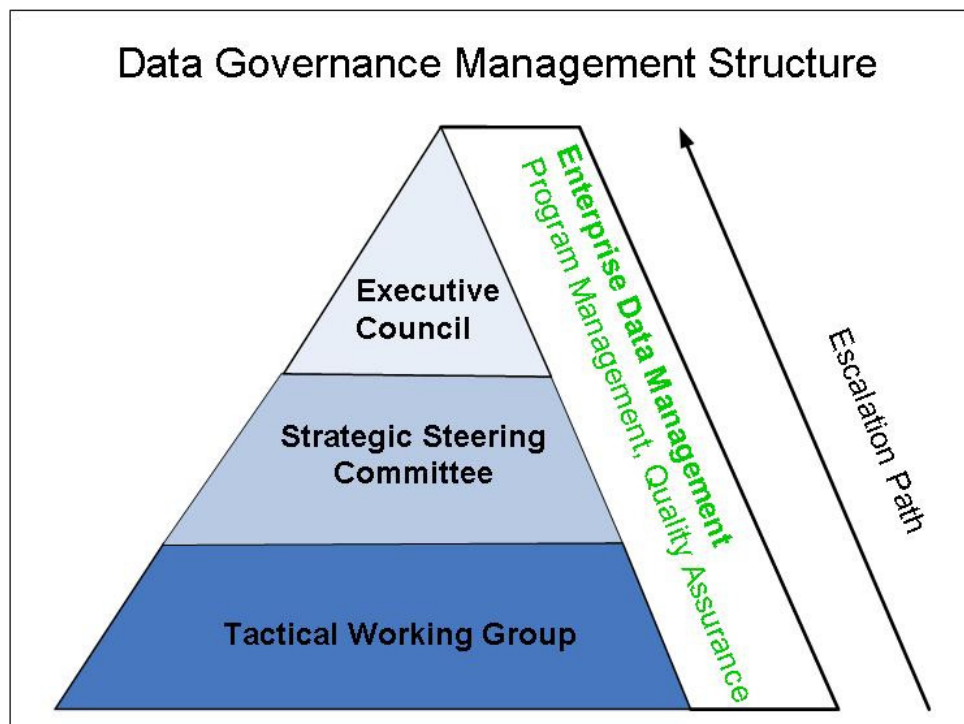


Figure 5: Data governance management structure and information flow.

Data governance is best conducted with a three-level management structure as shown in Figure 5:

- At the top level, the Executive Data Governance Council sets strategic goals and devises strategic plans to achieve them.
- At the second level, the Strategic Data Governance Steering Committee sets strategic goals and devises strategic plans to implement the goals and plans of the Executive Data Governance Council.
- At the third level, the data-steward members of the Tactical Data Governance Working Group implement the strategic plans of the Strategic Committee.

2.1.1 Business and Stakeholder Involvement

A common business adage states that “marketing is everyone’s business.” Likewise, security agencies think that “security is everyone’s business” and medical professionals think that “health is everyone’s business.” Though all of these viewpoints are over-simplifications, they do contain a grain of truth.

For any set of goals, some individuals or groups must bear primary responsibility for planning and achieving them: Tasks that are everyone’s responsibility can easily end up being no one’s responsibility. Nevertheless, in data governance – as in marketing, security, and health – the job cannot be done successfully by management acting alone.

To maximize the success of Federal Student Aid’s data governance program, management of the program should include representatives of both, IT and business units, as well as seeking input of both managers and users. At every level, the data governance team must seek the advice and the involvement of data governance stakeholders. This improves data governance because many new ideas come from those outside the formal management structure. It also encourages cooperation with the inevitable changes that data governance will require, whether they are changes in work processes or they are as simple as adapting to standard data formats and terminology.

2.1.2 Executive Data Governance Council

The Executive Data Governance Council (Executive Council) includes the CIO and other senior executives. It sets the overall mission and strategic goals of the data governance effort, as well as securing the funding, resources, and cooperation needed to support that effort.

Key to the Executive Council is its ability to make decisions on an “enterprise perspective” – that is, on what is best for the organization as a whole instead of merely desirable for this or that sub-unit. In addition, the Council will be available to resolve strategic problems as they arise. If other levels of data governance management are unable to resolve such problems, each lower level will escalate the problem to the next level up, ultimately reaching the Council.

2.1.3 Strategic Data Governance Steering Committee

The Strategic Data Governance Steering Committee (Strategic Committee) includes all the business owners, organizational leaders, IT representatives, enterprise architects, and the EDM Program Manager.

The Strategic Committee develops a task sequencing-plan for the tactical working group and will be available to resolve problems escalated from lower levels of data governance management. It reports to the Executive Council, which serves in turn as a decision maker for escalated issues.

The EDM Program Manager will chair the Strategic Committee. The EDM Data Governance and Metadata Manager will participate.

2.1.4 Tactical Data Governance Work Group

The Tactical Data Governance Work Group (Tactical Group) provides tactical-level implementation of the policies and decisions from higher-level data governance management. It will also receive assignments and their priorities from the Strategic Committee. The Group will

follow the data standardization policies and procedures for development of new data standards and metadata definitions.

Members of the Tactical Group will be subject matter experts most literate on data and database systems and on all the business processes that use the data. It should include data architects, database administrators, and technical end users; perhaps senior programmer/analysts, as well. The group members will outline the necessary components of the data governance initiative to meet the strategy as outlined by the executive committee. For instance, they will do impact analysis to determine how changes in specific data sets will affect the business and help resolve data quality problems.

If a development project identifies data problems, the Group will invite a representative of the project either to (a) discuss the problem and its possible solutions, or (b) help with research conducted by the Group. The Group will then develop a recommendation and present it to the Strategic Committee for approval. If members of the Tactical Group cannot reach agreement on an issue, they will escalate it to the Strategic Committee for decision.

The EDM Data Governance and Metadata Manager will facilitate.

2.1.5 Enterprise Change Control Board

The Enterprise Change Control Board (ECCB) is not part of the immediate data governance management structure. However, because data governance does involve both technical and organizational change, the members of the ECCB will most likely form the Strategic Committee. There will be close communication between these groups.

2.1.6 Specific Roles – Data Stewards

Data Stewards will have several crucial responsibilities, including defining, approval and maintenance of data governance policies and advising data owners and managers on the implementation of those policies. The main objective of data stewardship is to assist in managing Federal Student Aid's data assets to improve their reusability, accessibility and quality. Stewards will also have a hand in high-level information requirements definition. They develop and monitor control policies for data. They also serve as overall coordinators for enterprise data delivery efforts. They work with business owners, managers and users to continually improve agency data flow. Below is a brief description of the types of data stewards who will participate with the EDM including their roles and responsibilities.

2.1.6.1 Data Definition Stewards (Definers)

The Data Definition Steward is primarily a business role, but there will be opportunities for technology-focused individuals in the areas of IT infrastructure asset management areas to put business definition to technology-based data.

Responsibilities:

- Identifying the specific data that is needed to operate the business processes of their areas.
- Recording business definition and appropriate meta-data (information about the data such as business name, business description, valid values, etc.) for the data they define by

utilizing the tools and processes that have been identified and that are supported by the Data Stewardship Program Manager's resources (above the line).

- Identifying opportunities to share and re-use data.
- Identifying data quality standards.
- Participating in the enforcement of data quality standards. Identifying and resolving data quality issues pertaining to the data that they define.
- Ensuring the quality, completeness, and accuracy of data definition.
- Communicating new and changed business requirements to individuals who might be affected.
- Communicating concerns, issues and problems with data to the individuals who can influence change.

2.1.6.2 Data Production Stewards (Producers)

The Data Production Steward can be both a business and technical role, though it is typically considered a technical role. The Data Production Steward is essentially a businessperson who is responsible for entering and modifying data in the enterprise databases and information systems.

Responsibilities:

- Producing (inserting, updating, deleting) business and technical data in the IT systems that support the business processes
- Validating data that enters and exits business processes
- Coding and editing accurate data quality standards (including format, content, and data dependency) for the data they produce
- Ensuring the quality, completeness, and accuracy of data production according to the definition of the data provided by the Data Definition Stewards
- Communicating new and changed business requirements to individuals who might be affected
- Responsible for communicating concerns, issues, and problems with data to individuals who can influence change

2.1.6.3 Data Usage Stewards (Users)

The Data Usage Steward is primarily a business role (depending on the source of the data) related to the usage of data. Data Users potentially include constituencies outside of the organization who may or may not be included under the guidance of Data Governance, such as PESC.

Responsibilities:

- Accessing and using the data for its intended purpose

- Accessing information (meta-data) available about how the data was defined for the business and how the data was produced in the information systems in order to use the data for its intended purpose
- Ensuring the quality, completeness, and accuracy of data usage according to the definition of the data provided by the Data Definition Stewards
- Communicating new and changed business requirements to individuals who might be affected
- Communicating concerns, issues, and problems with data to individuals who can influence change

3.0 The Process of Data Governance

The process of data governance is determined by its goals. Its strategic goals are to standardize, harmonize, and integrate data across the enterprise. To achieve those strategic goals, data governance:

- Adopts formal policies and procedures to ensure data consistency, data standardization, data reuse, and data exchange.
- Creates a formal decision-making structure to standardize data across the enterprise.
- Provides a central mechanism for communicating data-related initiatives across the enterprise.
- Serves as a liaison between technical and business groups, both internal and external.
- Defines and enforces best practices in data standardization and data quality.

To achieve those goals, Federal Student Aid has established a data governance management and reporting structure consisting of an Executive Council, a Strategic Steering Committee, and a Tactical Working Group. All three of these management bodies will work with users to design and implement data governance policies and procedures that serve both the general needs of Federal Student Aid and the specific needs of individual departments and communities of interest. As an example, figure 6 displays the interaction of the management bodies involved in the standard approval process.

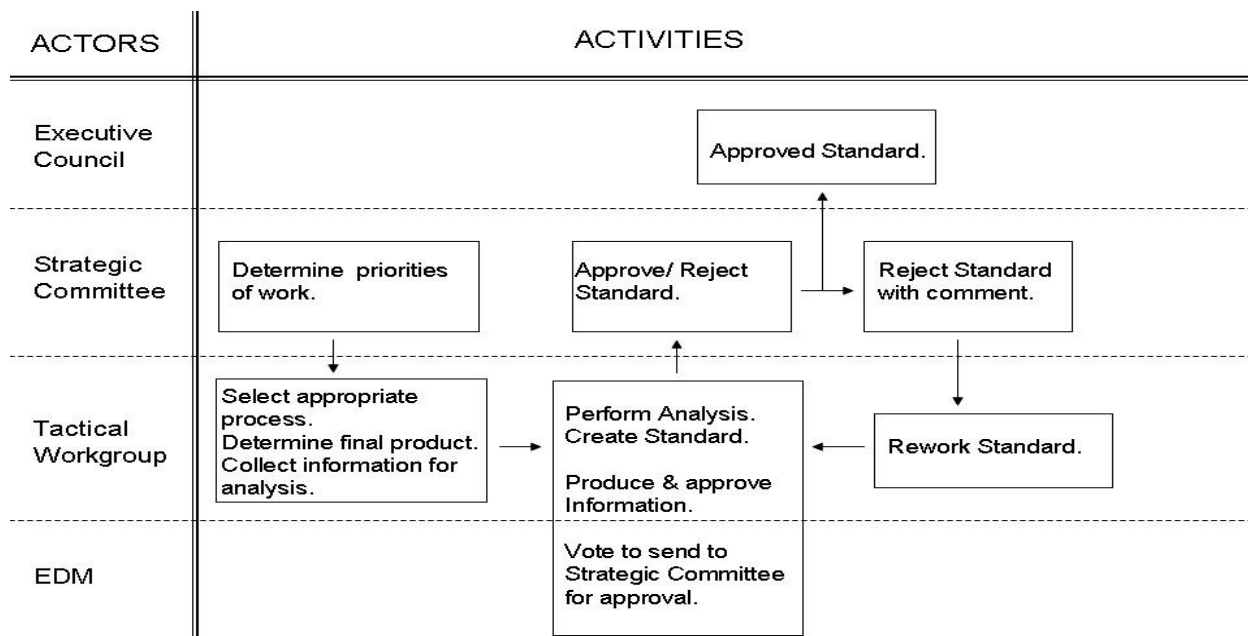


Figure 6: Standard Approval Process

3.1 High Level Plan and Milestones

The high-level plan for Data Governance and the related milestones cover the implementation of three key areas. These areas are Master Data Management (MDM), Enterprise Metadata Management and Data Stewardship.

The implementation of Master Data Management (MDM) focuses on the creation and maintenance of MDM standards, and the development of the “Organization” record (with business rules) in collaboration with the Integrated Partner Management (IPM) project. The documentation of the core data for the Organization record is targeted for completion by the end of August 2007. The development of the “Person” and “Aid” record (with business rules) enabling the integrated student view is planned for completion in FY08.

The implementation of Data Stewardship formalizes the accountability for managing Federal Student Aid’s data assets. Each Business Areas identifies two Data Stewards holding the authority to manage and make decisions regarding the data within their purview.

The EDM Team plans to execute Data Governance in the month of July 2007. As a first step, the Tactical Working Group will be formed and a kick-off meeting scheduled for July 18, 2007.

3.2 On-Going Data Governance

The data governance management bodies as described in section 2 - The Management of Data Governance will meet as needed to accomplish the goals specified in the charter. The Tactical Group is scheduled for weekly meetings beginning July 18, 2007 involving the Steering Committee and Executive Council as necessary.

The Team will provide a monthly status report to Federal Student Aid Executive Council and to the Business Technical Integration Group (BTIG) regarding the efforts underway. Monitoring and maintaining a data quality issues log is another important part of on-going data governance.

Appendix A. Glossary

The following terms are used this document or are pertinent to its content.

Column: A set of data values of the same type collected and stored in the rows of a table.

Database: A set of table spaces and index spaces.

Data governance: The execution and enforcement of authority over the management of data assets and the performance of data functions (Seiner, 2006).

Data stewardship: The formalization of accountability for the management of organizational data (Seiner, 2005).

Data Element: A generic term for an entity/class, table, attribute, or column in a conceptual, logical, and physical data model.

Enterprise Conceptual Data Model (ECDM): One of the initial components of Enterprise Data Architecture. The first enterprise level data model developed. The ECDM identifies groupings of data important to Lines of Business, Conceptual Entities, and defines their general relationships. The ECDM provides a picture of the data the enterprise needs to conduct its business.

(**Reference:** *U.S. Department of Education Enterprise Data Architecture – Enterprise Data Standards and Guidelines.*)

Enterprise Data Dictionary (EDD): One of the initial components of Enterprise Data Architecture. The EDD lists metadata objects and a complete description of the object at a sufficient level of detail to ensure that they are discrete and clearly understood. Such descriptions shall include, at a minimum, labels (names, titles, etc.) and definitions (or text descriptions), but may include additional descriptive metadata such as object type, classifications, content data type, rules (business, validation, etc.), valid and default values, etc. The EDD is the definitive source for the meaning of metadata objects. (**Reference:** *FSA-EDM*)

Enterprise Logical Data Model (ELDM): A component of a maturing Enterprise Data Architecture. The second enterprise level data model developed. It is the result of merging application level data model information into the existing Enterprise Conceptual Data Model (ECDM). The ELDM extends the ECDM level of detail. (**Reference:** *U.S. Department of Education Enterprise Data Architecture – Enterprise Data Standards and Guidelines.*)

Extensible Markup Language (XML): A meta-markup language for describing data elements that is extensible because it does not have a fixed set of tags and elements.

Extensible Stylesheet Language (XSL): A standard from the W3C for describing a style sheet for XML documents.

Enterprise Data Standards and Guidelines (EDSG): A component of a maturing Enterprise Data Architecture. Rules and recommendations for the creation and updating of metadata objects and structures as well as for creating conceptual and physical models and schemas at both the enterprise and application level. (**Reference:** *FSA-EDM*)

Schema (XML): A definition, written in Extensible Markup Language (XML) syntax, of constraints for the content type and data type of XML tags.

Schema (Data): Any diagram or textual description of a structure for representing data.
(Reference: *FSA-EDM*)

Table: A set of related columns and rows in a relational database.

Table Space: A portion of a database reserved for where a table will go. Table structure is the mapping of tables into table spaces.

Tag (XML): The markup portion of an Extensible Markup Language (XML) element surrounding the character data. The name of the tag reflects the content inside the XML element.

Uniform Resource Identifier (URI): The addressing technology for identifying resources on the Internet or a private intranet.

Uniform Resource Locator (URL): The address that defines the route to a file on a Web server.

Uniform Resource Name (URN): A name that identifies a resource on the Internet. Unlike URLs, which use network addresses (domain, directory path, file name), URNs use regular words that are protocol and location independent.

Valid (XML): A well-formed Extensible Markup Language (XML) document that also matches the Document Type Definition (DTD).

Well-formed (XML): An Extensible Markup Language (XML) document that has sufficiently specific grammar to be read and understood by an XML parser.

World Wide Web Consortium (W3C): An international industry consortium founded in 1994 to develop standards for the Web. The W3C has standardized many of the fundamental technologies of the Web, including HTML and XML, URLs and URIs, the SOAP protocol and the P3P privacy description.

Appendix B. Abbreviations / Acronyms

This appendix defines abbreviations and acronyms used in this document or relevant to it.

Abbreviation / Acronym	Applicable Term
CDM	Conceptual Data Model
ECDM	Enterprise Conceptual Data Model
ED	Department of Education
EDD	Enterprise Data Dictionary
Executive Council	Executive Data Governance Council
EDM	Enterprise Data Management
EDMMG	Enterprise Data Management Master Glossary
EDSG	Enterprise Data Standards and Guidelines
ELDM	Enterprise Logical Data Model
FEA	Federal Enterprise Architecture
FEAF	Federal Enterprise Architecture Framework
FIPS	Federal Information Processing Standards
FTE	Full Time Equivalent
IT	Information Technology
ITSS	Information Technology System Services
LDM	Logical Data Model
PDM	Physical Data Model
PESC	Postsecondary Electronic Standards Council
Strategic Committee	Strategic Data Governance Steering Committee
Tactical Group	Tactical Data Governance Working Group
XML	Extensible Markup Language

Appendix C. References

Chapin Consulting Group, “*Defining Business Metrics That Matter: Improving Business Results.*” (www.chapinconsulting.com), 2006.

Federal Student Aid, Task 15025 “Draft Enterprise Data Management Data Policies – Final”; June 1, 2007

Federal Student Aid, “*Enterprise Data Management Concept of Operations.*” Federal Student Aid, January 25, 2007.

Linstedt, Daniel, “Governing Governance,” *Teradata Magazine Online*, <http://www.teradata.com/t/page/150213/index.html> .

SearchDataManagement.com, *Data Governance Definition*, (http://searchdatamanagement.techtarget.com/sDefinition/0,290660,sid91_gci1151688,00.html)

Seiner, Robert S., “The Data Stewardship Approach to Data Governance Chapter One: The Data Will Not Govern Itself,” *The Data Administration Newsletter* (www.tdan.com)

Seiner, Robert S., “*Data Steward Roles and Responsibilities*” published by the Data Administration Newsletter (TDAN), July 2005 (<http://www.tdan.com/i033fe01.htm>).

Williams, Steve and Williams, Nancy, *The Profit Impact of Business Intelligence*. San Francisco: Morgan Kaufmann Publishers, 2006.

Appendix D. EDM support as part of OneEd Lifecycle

This section is intended to provide comprehensive understanding of the EDM support that will be provided during the OneED Lifecycle Phases. EDM will provide data services to projects and systems to ensure alignment with Federal Student Aid architecture, this will help projects by developing data related work products and promoting compliance with the enterprise data standards and best practices:⁹

1. Phase 1 - Enterprise Vision
2. Phase 2 - Initiative Vision
3. Phase 3 - Definition/Construction
4. Phase 5 - Implementation
5. Phase 6 - Support
6. Phase 7 - Retirement

A project/system will typically begin its journey through the life-cycle phases at Phase 1. Once project/system documentation is reviewed by the EDM, a recommendation will be made. The Executive Sponsorship and Governance will provide the oversight to the Business Owners. At each review phase the EDM must:

1. Provide data support
2. Assist pre-acquisition on data requirements
3. Provide metadata and data standards
4. Provide data architecture and engineering services
5. Provide continued support for all data related issues

During **Phase 1 – Enterprise Vision**, the EDM Team provides input from the data perspective to ensure that the Enterprise Vision reflects the needs for shared data elements. The EDM Team also gathers data requirements from such participation. The focus on this review is on preventing duplicate data.

During **Phase 2 – Initiative Vision**, the EDM Team provides assistance on data requirements.

Starting from **Phase 3 – Definition/Construction**, the EDM Team supplies project managers/architects with the artifacts created and maintained by various Data Governance and Metadata Management sub-functions, which are described in subsection 2.3. Artifacts, such as enterprise data models, data dictionary, naming standards, metadata repository and registry, promote the use of consistent data standards across projects. The EDM Team also provides standards and best practices in Data Quality and Data Security as inputs into the design stage.

⁹ Enterprise Data Management Concept of Operations - FINAL

In **Phase 4 – Implementation** stage, the EDM Team provides engineering and technical support for the design and development of data components, such as physical data models, databases, data sharing services and interfaces, and data security architecture. The architecture and technology standards created and maintained by Data Architecture, Data Warehousing and Data Security functions.

Phase 5 – Support occurs during operations and support of the project/system. The purpose of this phase is to make sure that the project/system is meeting its cost and performance goals. In terms of architecture alignment, the EDM will review the project/system to ensure alignment to the architecture.

The following table 2 provides an overview of the different focus areas and the respective validations performed by the EDM Team.

Phase	EDM Validation
Enterprise Vision	
1. Shared Data Elements	a. Are data elements captured in the Enterprise Data? Dictionary
2. Data Requirements	b. Are all relevant Data requirements accounted for?
Initiative Vision	
1. Data Architecture	a. Does the solution conform to Federal Student Aid data standards? b. What other project/systems create/use/reference similar data?
Definition/Construction	
1. Data Architecture	a. Is the data required by this project/system already available or will it be made available?
Implementation	
1. Data Architecture	a. Who will be utilizing the data created by this project/system? b. Are the requisite Information-Sharing Agreements in place?
Support	
1. Data Architecture	a. Who will be utilizing the data created by this project/system? b. Are the requisite Information-Sharing Agreements in place?

Table 2: EDM support of OneEd Life cycles.

Appendix E. Data Governance Charter

Purpose/Approach

Federal Student Aid established the Enterprise Data Management (EDM) program to support the business objectives and efforts to integrate processes and systems at an enterprise level. The EDM team is challenged with supporting the business units to standardize, harmonize, and normalize the data across the enterprise.

As a function of EDM, Data Governance and Metadata Management play a key role in the success of Federal Student Aid's integration and data standardization efforts by providing a collaborative, centralized, authoritative decision-making body with representation and expertise from all business capability areas. Data Governance and Metadata Management activities include establishing and implementing processes, policies, and procedures to facilitate the integration of data activities and products across business capability areas; and maintaining standardized data definitions and associated metadata.

Scope

The scope of the Data Governance and Metadata Management function involves the following:

- Formalize the EDM data governance structure, which includes forming the Strategic Data Governance Steering Committee (Strategic Committee) and the Tactical Data Governance Working Group (Tactical Group).
- Adopt and implement Data Standardization, Data Architecture, Data Warehousing, and Metadata Management processes and procedures.
- Create and maintain Master Data Management (MDM) standards.
- Enforce Data Quality standards and methodology.
- Implement and ensure consistent and transparent data architecture.

Objectives

The objectives of the Data Governance and Metadata Management function include:

- Adopt a formalized process for creating and promoting data consistency, data standardization, data reuse, and data exchange.
- Establish and facilitate a formal decision-making body for data standardization efforts across the enterprise.
- Provide a centralized vehicle for effective communication of data-related initiatives throughout business capability areas.
- Support internal business partners with data management for new development and integration projects.

- Function as the liaison between the technical and business groups within the internal and external education community.
- Follow project management, data standardization, and data quality best practices.

Deliverables

- Membership list – Strategic Data Governance Steering Committee (Strategic Committee) and Tactical Data Governance Working Group (Tactical Group)
- Data Governance Activity Matrix
- Metadata Inventory
- XML Core Components in the XML Registry & Repository
- Data Quality Issue Log
- Enterprise Conceptual and Logical Data Models
- Organization Record including business rules
- Person Record including business rules
- Data Model Repository

Quality Objectives

- Monthly interim status reports will be provided to the Business and Technology Integration Group (BTIG).
- Weekly interim status reports will be provided by the Tactical Group to the Strategic Committee.

Organization and Responsibilities

There will be a hierarchical governance structure consisting of 3 governance bodies, which will include the Executive Governance Council (Executive Council), the Strategic Data Governance Steering Committee (Strategic Committee), and the Tactical Data Governance Working Group (Tactical Group).

Members of these committees have not been formalized at this time, however the following is expected:

Executive Data Governance Council (Executive Council)

- The Executive Council will consist of Senior Executives (such as the Chief Information Officer).
- The Executive Council will provide guidance on the strategic direction of data governance to the Strategic Committee.

- The Executive Council will serve as the highest escalation point and final decision-making body in the governance structure should agreement not be reached within the other governing committees.

Strategic Data Governance Steering Committee (Strategic Committee)

- The Strategic Committee will consist of members of the EOCM and the BTIG.
- The Strategic Committee will provide updates and status to the BTIG and Executive Council, where appropriate.
- The Strategic Committee plans, prioritizes, and communicates data governance efforts between the Executive Council, Tactical Group, stakeholders, and communities of interest.
- The Strategic Committee will be facilitated and/or chaired by EDM.

Tactical Data Governance Working Group (Tactical Group)

- The Tactical Group will consist of Subject Matter Experts (SMEs) and Data Stewards (formally known as Data DAWG's).
- The Tactical Group will report to the Strategic Committee.
- The Tactical Group will be chaired and facilitated by EDM Data Governance Lead.
- The Tactical Group will implement the plans and policies defined by the Strategic Committee.

Plans for Support Activities

Documentation Support

Data governance will require the following documentation support:

- Agendas will be distributed 24 hours in advance of meetings.
- Meeting minutes will be taken and distributed to group members and interested others within 24 hours of the meeting.
- Action items listing responsible parties will be documented in the meeting minutes.
- All documents slated for review will be delivered electronically to group members 24 hours in advance of the meeting.
- Data standards/decisions will be available in a standard format electronically.
- Data quality issue log will be available in a standard format electronically.

Facilities and Resources

The governance committees will require a large meeting room. There will be a primary representative from each business area, however, more than one representative from each area may be necessary. All meetings will be open, the primary representative from each area will

gather at a large table, while other representatives and guests will sit in additional seating. Open communication will be encouraged and extended to all participants. However, the facilitator and/or chair reserve the right to limit dialogue to primary representatives if open communication prevents the group from staying within the scope of the task or discussion.

Risk Management

Primary business representatives may be working on other special projects.

- The facilitator and/or chair will identify alternate representatives for these areas.
- Business representatives are managing multiple competing priorities, however it is extremely important that we have continuity of membership.
- The facilitator and/or chair will request from business owners that this project be given priority and members be allowed to attend every meeting.
- The facilitator and/or chair will layout a master calendar (which is sensitive to alternative work schedules), and be efficient with people's time.

Schedule

Data governance will be managed as an on-going program with tasks related to the overall strategic goals of FSA. The governance committees will work in parallel with the integration efforts and development projects. The Strategic Committee and Tactical Group are to begin July 1, 2007.

Governance Effort Estimate

The total FSA staff work hours are estimated to be a total of 4894 hours per year.

- EDM Data Governance Lead - 1 person x 20 hours/week x 50 weeks = 1000 hours
- Tactical Group - 25 people x 3 hours/week x 50 weeks = 3750 hours
- Strategic Committee - 12 people x 1 hour/week x 12 weeks = 144 hours